FACT

SHEET

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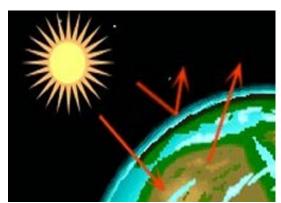


Global Warming

Global warming has been theorized and debated by the scientific community for decades; however, natural changes in the earth's climate and unreliable data made proving global warming difficult. To date, most of the scientific community agrees the earth's climate is being altered as a result of human activities, which increase greenhouse gas emissions. Scientists are continuing to work to understand global warming, the various sources of greenhouse gases, and possible effects on the earth's average temperatures.

The Greenhouse Effect

Solar energy (radiation) is one of the most important factors in the earth's climate and weather. As solar radiation passes through the atmosphere, it is either absorbed, reflected, or reemitted. Molecules such as water vapor and ozone function similar to panels of a greenhouse by trapping solar radiation, causing the earth's atmosphere to warm. This natural process of solar radiation being absorbed, reflected, and/or reemitted is known as the "greenhouse effect."



Radiation being absorbed, reflected, and reemitted

Greenhouse Gases

- ☐ Carbon dioxide, one of the most common greenhouse gases, is released when wood and fossil fuels including oil, natural gas, and coal are burned.
- ☐ Methane is emitted during the production and transport of natural gas, coal, and oil. It is also

- released during the decomposition of organic wastes in landfills, and from livestock.
- Nitrous oxide emissions result from agricultural and industrial activities, as well as the combustion of solid waste and fossil fuels.
- Manmade compounds such as hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (also linked with stratospheric ozone depletion) result from various industrial processes.

Every greenhouse gas has a different ability to absorb and trap heat in the atmosphere. Currently, greenhouse gases are measured in units of millions of metric tons of carbon equivalents (MMTCE); each gas can then be categorized by its global warming potential (GWP).

Natural "sinks" or "sponges" such as terrestrial vegetation and the ocean absorb large quantities of greenhouse gases. However, levels of greenhouse gases in the atmosphere are continuing to increase, not only because of deforestation, industrial processes, mining, and agricultural impacts, but also because of natural means, such as plant respiration and organic decomposition.

Climate Change

Utilizing global temperature records dating back to the 1860's, scientists have established that the global mean surface temperature has increased 0.5 to 1.0 degree Fahrenheit (° F) since the late 19th century and determined the 20th century was the warmest in the last 1,000 years. A change in global temperatures impacts regional climates and affects long-term weather patterns, which can then result in problems for forests, crops, water supplies, and ecosystems.

Impacts

Although there is uncertainty about the severity and timing of climate change it is generally estimated that sea levels will rise and desert regions will expand. Over the past century, snow cover and ice in the earth's polar regions has decreased,





and precipitation over land has increased by one percent, causing sea levels to rise 4 to 8 inches. Continually, increasing greenhouse gas emissions are only expected to further these changes.

The Intergovernmental Panel on Climate Change (IPCC), which formulates strategies to minimize global warming and continually assesses available scientific information, environmental, and socioeconomic impacts of climate change, projects an average global temperature increase of 1.0 to 4.5 ° F, and maybe more in the polar regions, over the next fifty years.

What's Being Done

The United States actively participates in a variety of national and international methods aimed at reducing greenhouse emissions and curbing global warming to protect the environment. It also is coordinating research and taking action to reduce, avoid, and better understand the risks associated with climate change.

Regulatory Agencies

In particular, Federal agencies, states, and local communities address global warming by preparing greenhouse gas inventories and adopting policies that will result in a decrease of greenhouse gas emissions. The Environmental Protection Agency (EPA) is actively engaged in partnerships aimed at addressing the challenge of global warming. In addition, many states have prepared greenhouse gas inventories and are actively pursuing programs to reduce greenhouse gas emissions.

Military Agencies

The Department of Defense (DoD) is in a unique position to demonstrate leadership in reducing greenhouse emissions. Temperature fluctuations caused by global warming can pose serious consequences that may threaten vital national security interests having, the potential to trigger political volatility in some regions. With this in mind, the DoD is poised to support climate-changing initiatives globally, while preserving military operations, sustainability, and readiness by working, where possible, to reduce greenhouse gas emissions and improving energy efficiency in facilities.

For More Information...

Contact PROACT at DSN 240-4214 or by e-mail at pro-act@brooks.af.mil, or visit the following websites:

- ☐ Intergovernmental Panel on Climate Change, http://www.ipcc.ch/
- U.S. Global Change Research Program http://www.usgcrp.gov/
- ☐ Global Change Data and Information System, http://globalchange.gov/
- ☐ Global Warming, EPA, http://www.epa.gov/globalwarming/
- ☐ Climate Change, DoD, https://www.denix.osd.mil/denix/DOD/Library/Climate/climate.html

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